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ABSTRACT

This document provides a framework of educational design principles from which educators and design professionals can structure the content of their educational facility development process, from the earliest strategic and educational planning stage to design, construction, occupancy, and facility management. Each of the 33 educational design principles presented has as its underlying premise that all learning environments should be learner-centered, developmentally- and age-appropriate, safe, comfortable, accessible, flexible, equitable, and cost effective. The principles are divided into the following areas: educational facility planning and design process principles; principles for site and building organization; principles for primary educational space; principles for shared school and community facilities and community spaces; principles related to the character of all spaces; and principles related to site design and outdoor learning spaces. (GR)

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THIRTY-THREE EDUCATIONAL DESIGN PRINCIPLES FOR SCHOOLS & COMMUNITY LEARNING CENTERS

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INTRODUCTION

The intent of this document is to provide a framework of educational design principles from which educators and design professionals can structure the content of their educational facility development process, from the earliest strategic and educational planning right through to design, construction, occupancy and facility management.

The body of knowledge concerning well-designed learning environments is contained in the following thirty-three educational design principles. These principles are derived from a variety of sources: from the reflective practice of educators and design professionals to the empirical research of environmental psychologists and educational researchers. Each educational design principle takes as an underlying premise that all learning environments should be learner-centered, developmentally- and age-appropriate, safe, comfortable, accessible, flexible, and equitable in addition to being cost effective. These premises run through all principles and should be understood to moderate the appropriateness of each principle in practice.

The ultimate goal is to optimize the school and its surrounding community as an effective setting for learning. No single school building process will be able to address and implement all of these principles; some may not apply to the situation, others might not be appropriate due to budgetary limitations. Certainly, if school size research suggests be build learner groupings of 100, building a school this small may not be cost effective ñ other principles may need to be employed in combination to meet this principle, such as the principle of creating schools within schools. The objective in using this document as a design guide is to consider as many of these principles as are appropriate.

The principles are divided into educational facility planning and design process principles, principles for site and building organization, principles for primary educational space, principles for shared school and community facilities, community spaces, principles related to the character of all spaces, and principles related to site design and outdoor learning spaces.

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Educational Facility Planning & Design Process Principles

Educational Design Principle No. 1:

Maximize Collaboration in School Planning and Design

In order for an educational facility to be successful in meeting the needs of learners, a process of planning, design and construction must be followed. As such, the process by which a building is conceived can be long and complex. For these reasons, the planning process must be itself planned carefully based on clear project objectives. From the very beginning of strategic facility planning process one main objective should be to obtain multiple perspectives while exploring all potential problems and opportunities. Gaining this wider perspective can avert many roadblocks to implementation later in the process when financial resources are being committed. Involve a wide spectrum of representatives from the community during the planning and design of a school or community center. In addition to school administrative decision-makers, encourage the active participation of parents, business and community leaders, teachers and even students when possible. Recommendations from this group should be taken seriously ñ this group represents the broader community interest.

Providing broad community participation can be a difficult and frustrating process. Its can also provide a variety of benefits. Authentic participation can assist in building community support for the passage of bond issues as well as give the community a sense of ownership in the process and product. Through broad community input, issues can be quickly uncovered, while the structure of the planning process can provide a means to proactively address those issues. In addition, participation contributes the educational process of the entire community by initiating and encouraging a dialogue between the school and its surrounding community. Finally, participation may defuse politically motivated issues and lay the groundwork for constructive dialogue between normally divisive groups in the community.

Brubaker, W.C. (1998). Planning and designing schools. New York: McGraw-Hill.

Graves, B. E. (1993). School ways: The planning and design of Americaís schools. New York: Architectural Record/McGraw-Hill.

Fielding, R. (1999, August). Planning the learning community: An interview with Concordia's Steven Bingler.
http://www.designshare.com/Research/Bingler/LearningCommunity1.htm

Jilk, B. (1997, July). The design-down process: An alternative to the traditional education specification process for defining learning environments. Council of Educational Facility Planners International (CEFPI) Issue Track..

http://www.cefpi.com/

Lackney, J.A. (1994). Educational facilities: The impact and role of the physical environment of the school on teaching, learning and educational outcomes. Johnson Controls Monograph Series Report R94-4. School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research.

Sanoff, H. (1994). School design. New York: Van Nostrand Reinhold.

For more information on maximizing collaboration in school planning and design visit the following sites:
http://www.edfacilities.org/

Educational Design Principle No. 2:

Build a Proactive Facility Management Program

Design a proactive facility management program during the planning phase of a project to anticipate facility problems, rather than reacting to problems when they occur. The facilities management process should be an integral part of the school design to assure long term and optimal use of the facility. Appropriate design decisions can support custodial care, ease of maintenance of school grounds and building equipment, materials and surfaces, as well as support the flexible scheduling of space for future programs. The schools we build now will be with us for the next fifty years. Monitoring the use of a facility over the life span of that building will be critical to optimizing its use.

Management of the facility if often thought to include the maintenance and operations of the ìphysical plantî ñ the mechanical, electrical, plumbing, power, security and other building systems as well as custodial and maintenance programs and operations. However, just as important is the management of the use of the educational facility for daily educational activity and organization ñ scheduling activities, assigning program space, effective utilization of space, adequacy of the type and size of instructional space and the ambient qualities of the environment for learning. This second form of facility management is often neglected. One strategy is to appoint a site-based planning team to monitor the diverse aspects of a comprehensive facility management program to assist the school administrator in management decisions.

Butterfield, E. (1999, July). School renovation and the importance of maintenance: Q& A with Charles Boney, Jr.
http://www.designshare.com/Research/Boney/Renovation1.htm

Lackney, J.A. (1996). Quality in school environments: A multiple case study of environmental quality assessment in five elementary schools in the Baltimore City Public Schools from an action research perspective. School of Architecture and Urban Planning, University of Wisconsin-Milwaukee. UMI Dissertation Services No. 9717142.

OECD (1996). Making better use of school buildings. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

For further information on building a proactive facility management program visit
http://www.edfacilities.org/ir/custodial_staffing.cfm
http://www.edfacilities.org/ir/energy.cfm
http://www.edfacilities.org/ir/iaq.cfm

Educational Design Principle No. 3:

Plan Schools as Neighborhood-Scaled Community Learning Centers

Plan for the traditional school building to be transformed into a community learning center. Interlace residential neighborhoods, the larger community and school organizations, functions and facilities. Allow shared school and community functions into a cohesive facility or network of closely adjacent facilities. Locate and site the community learning center in a well-defined neighborhood. This will provide opportunities for children and parents to walk to the school and provide an identity for that community. Facilities that are close to the neighborhoods of the children they serve provide opportunities for children to walk and bike with the added public health benefit of increasing their physical activity, rather than relying on more costly modes of transportation. Allow schools to become a beacon within the community for those seeking opportunities for enrichment. Provide a variety of services, at flexible schedules, accessible by people of different backgrounds. Create an environment that draws the community to the school and increases interaction. The center will provide facilities accessible for the entire community, creating an increased involvement and awareness of the educational process. Finally, school facilities that act as true community centers serve the broader societal goals of providing the setting for meaningful civic participation and engagement at the local level.

Decker, L.E. & Romney, V.A. (1994, August). Educational restructuring and the community education process. A special report of the National Coalition for Community Education. Fairfax, VA: National Community Education Association.

Fanning/Howey Associates. (1995). Community use of schools: Facility design perspectives. Fanning/Howey Associates, Inc.

Hodgin, P.A. (1998, January). District wide planning: Schools as community resources. AIArchitect.

http://www.e-architect.com/pia/cae/distwide.asp

OECD (1996). Making better use of school buildings. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

U.S. Department of Education. (1999, April). Design principles for planning schools as centers of community.
http://www.edfacilities.org

Warner, C. & Curry, M. (1997). Everybodyís house: The schoolhouse, best techniques for connecting home, school and community. Corwin Press.

NSBN. (2000, January). The development of educational facilities through joint use mechanisms. New Schools/Better Neighborhoods Joint Use Working Group. **http://www.nsbn.org/**

For further resources on Design Schools as Neighborhood-Scaled Community Learning Centers visit the following sites
http://www.edfacilities.org/ir/community_use.cfm

Educational Design Principle No. 4:

Plan for Learning to Take Place Directly in the Community

A variety of social and economic factors have created an environment in which many educators recognize that learning happens all the time and in many different places. The school building is just one place learning takes place. While the school building is being seen more as a community center, the idea of embracing the whole community as a learning environment has evolved in a complementary fashion. Educational programs can, and are taking advantage of educational resources in urban, suburban and rural settings alike. Formal educational program partnerships have been established with museums, zoos, libraries, other public institutions, as well as in local business workplace settings.

In addition, increasing costs of public spending for education has encouraged the idea of sharing the school and community facilities to prevent cost duplication of similar facilities such as gymnasiums, auditoriums, performance spaces, and conferencing facilities. Sharing facilities can also realize long-term maintenance and operating cost savings over the life of the building. Sharing school facilities with a variety of community organizations may fostering meaningful inter-organizational partnerships that can strengthen educational opportunities for learners.

Duke, Daniel L. (1999, February). The Future of High Schools; What Will Secondary Education Look Like In the Next Century? Texas A&M University, CRS Center.
http://archone.tamu.edu/~crscenter/programs/Rowlett99/FutureOfHighSchools.html

Fielding, R. (1999, August). Planning the learning community: An interview with Concordia's Steven Bingler.
http://www.designshare.com/Research/Bingler/LearningCommunity1.htm

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.
U.S. Department of Education. (1999, April). Design principles for planning schools as centers of community. **http://www.edfacilities.org/ir/edprinciples.htm**

For further resources on Plan for Learning to Take Place Directly in the Community visit the following sites:
http://www.edfacilities.org/
http://www.edfacilities.org/ir/satellite_schools.cfm
http://www.edfacilities.org/ir/future.cfm

Principles for Site & Building Organization
Educational Design Principle No. 5:

Create Smaller Schools

Limit the size of learner groupings to 60-75 students in pre-school, 200-400 students in elementary school, 400-600 in middle school and not more than 600-800 students in secondary school. If a community learning center must house more than 75 preschoolers, 400 elementary or middle-school students, or more than 800 high-school students, decentralize the facility (both administratively and architecturally) into a village, campus, or multi-faceted building comprised of a series of interconnected schools-within-a-school for a maximum of 400 students. Another strategy for reducing the scale of educational facilities is to distribute and network various school and community functions throughout the neighborhood in both new and existing sites.

The research community has known for some time that small schools (100-150), in comparison with large schools (over 2,000) offer students greater opportunities to participate in extracurricular activities and to exercise leadership roles (Barker & Gump, 1964). In particular, participation in school activities, student satisfaction, number of classes taken, community employment, and participation in social organizations have all been found to be greater in small schools relative to large schools. In addition, small schools, on the order of 500 or less, have lower incidence of crime levels and less serious student misconduct. Research suggests a negative relationship between math and verbal ability tests and elementary school size controlling for socio-economic differences. Additionally, smaller elementary schools particularly benefit African-American studentsí achievement.

Barker, R. & Gump, P.V. (1964). Big school, small school. Palo Alto, CA: Stanford University Press.

Fowler, W.J., Jr. (1992). What do we know about school size? What should we know? Paper presente
Educational Research Association Annual
Meeting, San Francisco, CA. Available from the Office of Educational Research and Improvement, Nat
Statistics, U.S. Department of Education, Washington, D.C.

Garbarino, J. (1980). Some thoughts on school size and its effects on adolescent development. Jourr
9, 19-31.

Howley, C. (1994, June). The academic effectiveness of small-scale schooling (An Update). ERIC Dig

http://7-12educators.about.com/education/primseced/7-12educators/msub10.htm?COB

Irmsher, K. (1997). School size. ERIC Digest, Number 113. ED414615 97. Eugene, OR: ERIC Clearin
Management. **http://www.ed.gov/databases/ERIC_Digests/ed414615.html**

Lashway, L. (1998-99, Winter). School size: Is smaller better? Re

search Roundup 15, 2. Eugene, OR: ERIC Clearinghouse on Educational Management.

http://eric.uoregon.edu/publications/roundup/W98-99.html

Rayv id, M. A. (1999). Current literature on small schools. ERIC Digest. ERIC Clearinghouse on Rural
Charles*on, WV. (ED425049 99)

Raywid, M. A. (1996). Taking stock: The movement to create mini-schools, schools-within-schools, a
Urban Diversity Series No 108. New York: ERIC Clearinghouse on Urban Education, Teachers College
396 045). **http://eric-web.tc.columbia.edu/monographs/uds108/**

The Architectural League of New York & Public Education Association. (1992). New Schools for New Y
small schools. The Architectural League of New York, The Public Education Association. New York: Pri

For further information on creating smaller schools visit:
http://www.edfacilities.org/ir/size.cfm

Educational Design Principle No. 6:

Respect Contextual Compatibility While Providing Design Diversity

Blend community learning centers into the pattern and character of the local, surrounding community neighborhoods and facilities. In a complementary fashion, create differently styled schools ñ variations on the overall design theme ñ to respond to the need for community identity and as a response to active parental, children, teachers, administration, and community participation.

As real estate development sprawl has expanded, the principle of creating well-defined neighborhoods has been ignored in urban planning. While a strong neighborhood may not directly influence educational performance, the sense of cohesion experienced by community members may help increase parental involvement in neighborhood schools. Research has shown that parental involvement in the school is critical to a learnerís success. By creating a contextually compatible school, people may feel that the school is part of the neighborhood, and in turn, part of them. While maintaining a sense of continuity through contextual design, creating diversely designed environments that have their own identity is equally important in enabling community members to recognize the school as a symbol of their community.

Moore, G.T. & Lackney, J.A. (1994). Educational facilities for the Twenty-first Century: Research Analysis and Design Patterns. Report R94-1, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research. Also available from ERIC Document Reproduction Service, No. EA 026223.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 7:

Consider Home as a Template for School

Use friendly, "home-like" elements and materials in the design of the school at all scales when appropriate and possible. Home-like characteristics might include: creating smaller groupings of students often called ìfamiliesî in the middle school philosophy, designing appropriately-scaled elements, locating restrooms near instructional areas, providing friendly and welcoming entry sequences, creating residentially sloping roofs, and creating enclosed ëback-yardsí. Use familiar and meaningful elements from the surrounding residential neighborhood as the "template" for the imagery of the new school/community learning center.

The transition from the home setting to institutional settings such as the school environment can be stressful, especially for younger children. Experience tells us that building in physical and social home-like characteristics may reduce anxiety on the part of both parent and child, help children feel more comfortable and enable to concentrate on learning.

Crumpacker, S.S. (1995). Using cultural information to create schools that work. In Meek, A. (Ed.) Designing places for learning. Alexandria, VA: ASCD. 31-42.

Moore, G.T., Lane, C.G.., Hill, A.B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

Educational Design Principle No. 8:

Meander Circulation while Ensuring Supervision

Beware of long corridors. Circulation such as hallways and corridors are a costly percentage of a school building. However, circulation can double as an active learning space for the school. Design meadering pathways to increase opportunities for positive social interaction. Use circulation to create gentle transitions from different spaces, taking advantage of turns and bends to create unique areas of learning. Conversely, for issues of safety, circulation paths must be designed to ensure supervision by not only administrators, but students, teachers and parents. Creating central activity nodes that connect short paths is one strategy for maintaining visual supervision without creating long institutional-style corridors.

Not all learners and faculty share a common room or floor. Many times the only meeting these people have is in areas of circulation. It is important to take advantage of these impromptu meetings by designing the circulation space within the school as a place to converse and share of information and ideas. Simultaneously, public circulation space is known to be one of the most difficult places in a school to keep safe from illicit activity. The goals of encouraging positive social behaviors and reducing violence do not have to be mutually exclusive. In fact, if appropriately addressed through design, encouraging positive behaviors can have a mediating effect on the reduction of unwanted social behaviors.

Moore, G.T. & Lackney, J.A. (1994). Educational facilities for the Twenty-first Century: Research Analysis and Design Patterns. Report R94-1, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research. Also available from ERIC Document Reproduction Service, No. EA 026223.

Moore, G.T., Lane, C.G., Hill, A.B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

Educational Design Principle No. 9:

Design for Safe Schools

Safe school design must be seen as being only one component of a larger system of crime prevention measures that include administrative procedures, student, staff, and community training programs, and the implementation of security programs. Design and use of the environment directly affects human behavior which, in turn, influences opportunities for crime and fear of crime, and impacts quality of life. These opportunities for crime can be reduced through appropriate planning and design decisions.

Three critical safe school design principles include access control, natural surveillance, and definition of territory. Natural access control denies access to a crime target and creates a perception of risk in offenders. Access control uses doors, shrubs, fences, gates and other physical design elements to discourage access to an area by all but its intended users. Natural surveillance assures that offenders and intruders will be observed. It increases the likelihood that individuals who care but are not officially responsible for regulating the use of space will observe these individuals and either challenge their behavior or report it to someone who is officially responsible. Surveillance is achieved by placing windows in locations that allow intended users to see or be seen, while ensuring that intruders will be observed as well. Opportunities for surveillance are enhanced, by providing adequate lighting, glass and landscaping that allow for unobstructed views. Locate administrative areas directly adjacent to the main entrance to the school. Territorial reinforcement suggests that physical design can contribute to a sphere of influence so that users develop a sense of "ownership" that is perceived by offenders. Territory is defined by sidewalks, landscaping, porches and other elements that establish the boundaries between public and private areas.

Crowe, T.D. (1991). Crime prevention through environmental design: Applications of architectural design and space management concepts. National Crime Prevention Institute. Boston: Butterworth-Heinemann.

Department of Education & Department of Justice. (1998, August) Early Warning, Timely Response: A Guide to Safe Schools. **http://www.ed.gov/offices/OSERS/OSEP/earlywrn.html**

Safer Places: The Crime Prevention Through Environmental Design Resource Site. **http://www.arch.vt.edu/crimeprev/pages/home.html**

For further information on designing safe schools visit **http://www.edfacilities.org/ir/safety_security.cfm**

Principles for Primary Educational Space
Educational Design Principle No. 10:

Cluster Instructional Areas

Cluster instructional areas around central cores of shared instructional support and resource spaces. Instructional spaces should act as ìalcoves for learningî off centrally located shared resource space. The core should include informal meeting space, seminar and shared conference rooms, a small computer hub and teacher offices. Each cluster may support traditional disciplinary teaching (history, math, arts) or interdisciplinary teaching. Each cluster may contain grade-level groupings or multi-age groupings of learners. To maximize the flexibility of instructional clusters use any appropriate combination of stand alone movable partitions, movable modular furnishings, large double doors out of room to shared spaces.

Clustered instructional areas provide the opportunity for the greatest flexibility for pedagogical goals and educational program changes from organizational strategies (grade-level groupings to multi-age groupings of learners) to instructional strategies (team teaching and interdisciplinary instruction). Open-plan designs of the 1960ís and 1970s may have been partially successful at broadening the educational experience of learners, but both teachers and learners found that too many physical distractions were experienced for these open physical settings to become the norm. The key to new classroom arrangement then, is to provide spaces that are open but then have areas of enclosure for more task specific activities. These spaces will then be diverse in use but not have the sight and sound distractions as before.

Brubaker, W.C. (1998). Planning and designing schools. New York: McGraw-Hill.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 11:

Provide Space for Sharing Instructional Resources

The reality of limited resources suggests strongly the sharing of all available instructional resources. Provide a well-defined area directly adjacent to instructional alcoves and core spaces that provide technology-rich resources that can be shared by learners in an instructional cluster. Resources can take a wide variety of forms from small, specialized libraries, information technology and other instructional media to special equipment and general workspace.

For educators to be successful, the availability of resources by students and faculty is important. Students that do not have access to learning spaces, resources, and teachers will be at a disadvantage. By creating instructional areas that have direct accessibility to these resources, the learning process will be supported.

Chupela, D. (1994). Ready, set, go!: Childrenís programming for bookmobiles and other small spaces. Atkinson, WI: Alleyside Press.

Feinberg, S., Kuchner, J. F. & Feldman, S. (1998). Learning environments for young children: Rethinking library spaces and services. Chicago: American Library Association.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 12:

Design for a Variety of Learning Groups and Spaces

Allow for as wide a variety of group learning sizes as possible. Nest learner groupings from an entire ìfamilyî of 100 learners, to five groups of 20 learners, to groups of 12, 4-6 and 1-2 learners. Create a variety of adjoining learning spaces and arrangements in keeping with the educational program goals of the school. Create partially open/partially closed space, with adjacent, smaller, enclosed spaces, the smaller spaces separated yet connected. Ensure moderate visual openness, yet also ensure adequate acoustical barriers. Articulate each cluster of instructional areas by gathering several small-group learning areas around a space for large-group instruction. Each of the small group areas can be further divided into individual activity areas to allow for quiet, individualized self-directed learning.

Learning takes place in many different kinds and qualities of space. The self-contained classroom can no longer provide the variety of learning settings necessary to successfully facilitate Twenty-first century learning.

Crumpacker, S.S. (1995). Using cultural information to create schools that work. In Meek, A. (Ed.) Designing places for learning. Alexandria, VA: ASCD. 31-42.

Meek, A. (Ed.) (1995). Designing places for learning. ASCD/CEFPI.

McMillan, D. (1997). Classroom spaces and learning places: How to arrange your room for maximum learning. Charthage, Il: Teaching & Learning Company.

Weinstein, C. S. & Mignano, A.J. Jr. (1997). Elementary classroom management: Lessons from research and practice. New York: McGraw-Hill.

Weinstein, C.S. (1996). Secondary classroom management: Lessons from research and practice. New York: McGraw-Hill.

Educational Design Principle No.13:

Keep Class Sizes Small

The size of the primary learning group in which the child spends the most time makes a significant difference in the quality of education and development. Create instructional areas that allow for 12-16 learners in early childhood and elementary grade levels, 16-20 learners in middle school grade levels, and 20-24 learners in secondary school grade levels.

Class size research points directly to a social and physical link to achievement. Children in smaller classes (13-17 per room) have been found in one study to outperform those in regular-sized classes (22-25 per room). In the early grades, children in smaller classes were found to outperform children from regular class sizes in all subjects, but especially in reading and mathematics test scores with average improvements of up to 15%. Smaller classes were especially helpful for children in inner-city schools. A follow-up study that used the same schools, students and tests has shown that students previously in small classes demonstrated statistically significant advantages two years later over students previously in regular sized classes. Performance gains ranged from 11-34%. Reasons for these gains may be that, more and higher quality student-teacher interactions are possible in a smaller class, and that spatial density and crowding are also reduced. In a study of younger children it was found that increased density can induce stress in children thereby increasing aggressive behavior and distraction in younger children.

Achilles, C.M. (1992, September). The effect of school size on student achievement and the interaction of small classes and school size on student achievement. Unpublished manuscript, Department of Educational Administration, University of North Carolina-Greensboro, Greensboro, North Carolina.

Crumpacker, S.S. (1995). Using cultural information to create schools that work. In Meek, A. (Ed.) Designing places for learning. Alexandria, VA: ASCD. 31-42.

Department of Education. (1999, March). Reducing class size: What do we know? **http://www.ed.gov/pubs/ReducingClass/**

Department of Education. (1998, April). Class size and students at risk: What is known? What is next? **http://www.ed.gov/pubs/ClassSize/**

Loo, C. (1976). The effects of spatial density on behavior types of children. ERIC, National Institute of Mental Health.
NAEYC. (1999). Reducing Class Size: A Goal for Children's Champions, National Association for the Education of Young Children.
http://www.naeyc.org/public_affairs/pubaff_index.htm

Educational Design Principle No. 14:

Provide Resource-Rich Well-Defined Activity Pockets

Providing the raw space for learning activities to take place is only the first step in providing a successful place for learning. Ensure that each large-group, small-group, and individual learning space is an architecturally well-defined ìactivity pocketî for 2-5 learners with all the surfaces, display, storage, and resources necessary for that learning activity contained within. Activity pockets can take on a variety of architectural forms from simple learning centers, to lofts, small alcoves and lecture pits. Include a variety of furniture layouts for learner activities ñ some centripetal for group work, some facing outward for individual work in the same activity pocket.
Small activity spaces have been found to be important to the development of young learners. These spaces tend to encourage more learner engagement in a learning task, more teacher involvement with individual learners, less teacher interruptions, and more exploratory behavior, social interaction and cooperative behaviors among learners. Smaller clusters lead to increased use of learning materials, to increased substantive, content questions, and less non-task oriented movement, less loud conversations, longer attention spans, and overall greater satisfaction. Secluded study space within an instructional area is also important for studentsí development and have been found empirically to relate to performance. Structured reading areas have shown to significantly increase literature use by students.

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

Moore, Gary T. (1986). Effects of the spatial definition of behavior settings on childrenís behavior: A quasi-experimental field study. Journal of Environmental Psychology, 6, 205-231.

Moore, Gary T. & Lackney, Jeffery .A. (1994). Educational facilities for the Twenty-first Century: Research Analysis and Design Patterns. Report R94-1, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research. Also available from ERIC Document Reproduction Service, No. EA 026223.

Educational Design Principle No. 15:

Integrate Early Childhood Education into the Community School

When possible, include a developmentally-oriented child care center and early childhood development education center that are both integrated programmatically with the larger school organization. Site the center in the same neighborhood, close to the school or on the same site if possible.

Reasons for including early childhood programs within the school go well beyond the more reactive reasons such as teenage pregnancy and unavailability of affordable daycare for working mothers and even teachers. Research indicates that windows of opportunity for learning start at a very early age, and providing some structured learning experiences for children can be beneficial in the later years. Cooperation between the school and the early childhood education/childcare facility can ease the transition for the student. Many schools find that providing childcare encourages parents to keep their child at that school site further easing the transition from home to school. In addition, childcare can also ease the return to school for teenage parents to complete their secondary education.

Bredekamp, S. & Copple, C. (1997). Developmentally appropriate practice in early childhood programs. New York: National Association for the Education of Young Children (NAEYC).

Coburn, J. (1999, January). Childcare in high school. School Planning and Management.
http://www.spmmag.com/articles/1999_01Jan/ChildCare.html

Jones, E. & Nimmo, J. (1994). Emergent curriculum. New York: National Association for the Education of Young Children (NAEYC).

U.S. G.S.A. (1998, June). Child Care Center Design Guide. U.S General Services Administration, Public Buildings Service, Child Care Center of Expertise. **http://www.gsa.gov/pbs/centers/child/childcare.pdf**

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

For further information on integrating early childhood education into the community school visit:
http://www.edfacilities.org/ir/childcarecenters.cfm

Educational Design Principle No. 16:

Provide a Home Base for Every Learner

A locker along a corridor does not make a home base. Within the physical boundaries of each instructional area, create a home base for the learner for whom that learning group becomes their personal space. Include cubbies and lockers for personal belongings arranged in small groups to provide space for informal social interaction. Allow learners to personalize their space as much as possible. For younger children (infant through 3 or 4-years old) provide space for naps. When possible, locate washrooms and lunchtime eating areas near the home bases at the primary grades.

Research indicates that personalization of space is an important factor in the formation of an individualís identity and sense of self-worth. Learners in schools are a lot like workers in the workplace in that it is important for most people to have some space that is their own. A desk or locker for possessions and personal belongings are basic elements of any worksetting. By providing similar forms of personal space within the school for each learner, those learners will gain a more positive sense of self and take pride and ownership in their school.

Bredekamp, S. & Copple, C. (1997). Developmentally appropriate practice in early childhood programs. New York: National Association for the Education of Young Children (NAEYC).

Jones, E. & Nimmo, J. (1994). Emergent curriculum. New York: National Association for the Education of Young Children (NAEYC).

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

Moore, Gary T., Lane, Carol G., Hill, Ann B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

Educational Design Principle No. 17:

Regard Teachers as Professionals

Teachers are professionals and should be regarded as such. In addition, teachers need home bases as well as students. Provide private or semi-private office space for teachers, including space for personal belongings, phone/fax, personal computer, information technologies, desk and personal library. Cluster teacher offices together to form a grouping of no more than four teachers. The location of teacher offices should be adjacent but not central to instructional areas ñ teachers are not the center of education, learners are. In place of the old ìteachersí lounge,î provide conferencing rooms where larger groups of teachers can meet formally to exchange information and teaching experiences with themselves and with school visitors. Include a balance formal and informal/break-out meeting space, with support space such as kitchenettes, storage and private restrooms.

Providing shared facilities for school faculty will create opportunities for teachers to reflect, form and communicate ideas central to their development as professionals. In the factory-model school, teachers are more like laborers than professionals, and students are the products of their labors. The teacherís workspace in the factory-model school consists of a desk in the front of the self-contained classroom, which is neither private from students, nor connected to other faculty. By providing shared offices for the faculty adjacent to learning areas, teachers would still be accessible to learners, but would have privacy from the formal instructional area from which to adequately plan learning activities.

Johnson, Susan M. (1990). Teachers, power, and school change. Cambridge, MA: Harvard University Press.

Jones, E. & Nimmo, J. (1994). Emergent curriculum. New York: National Association for the Education of Young Children (NAEYC).

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

Educational Design Principle No. 18:

Provide Studios to Support Project-based Learning

New instructional methods based on real-world authentic learning and authentic assessment methods will require a new form of instructional space suggested by studio-based learning settings common in art education. Provide locations for the generation and storage of semester long projects as well as student portfolios. Include space for individual, small group, and larger group productions, including but not limited to audio/visual/digital studios, dance and performance studios, workshops for various visual arts, photocopy machines, and large open project tables. Adjacent the portfolio process studio, provide flexible experimental lab stations for groups or individuals to explore and demonstrate discoveries in the physical and biological sciences. Include moveable laboratory furnishings, storage space for equipment, and visibility and ease of movement through the space.

Project-based learning and studio-based instruction emphasize learning as a team and foster cooperation and sharing of ideas that will enable students to process material better. Rather than struggle as individuals, learners can use the strengths of a group to decrease the time it takes to learn al lesson and increase the amount of information absorbed. One of the most natural ways of learning is that of learning-by-doing. Research indicates that participating in a learning exercise, activity or experiment in addition to attending a lecture engages a broader array of ìmultiple intelligencesî than relying on lecture alone.

Bredekamp, S. & Copple, C. (1997). Developmentally appropriate practice in early childhood programs. New York: National Association for the Education of Young Children (NAEYC).

Jones, E. & Nimmo, J. (1994). Emergent curriculum. New York: National Association for the Education of Young Children (NAEYC).

Lackney, Jeffery A. (1999, August). A history of the studio-based Learning model. Educational Design Institute. http://www.edi.msstate.edu/studio.html

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

Educational Design Principle No. 19:

Encourage Administrative Leadership by Decentralizing Administrative Space

Decentralize administrative functions throughout the community learning center, yet ensure that each portion is visuable to public areas of the school and not on the periphery of the school or hidden from view. If the community learning center is subdivided into more than one school-within-a-school, disperse administration into each wing, pod or cluster such that it is in the mainstream of each segment of the center. Organizationally, if appropriate, consider alternative approaches to developing leadership in the school such as implementing site-based management teams.

Research indicates that schools that have an effective leader in the role of the principal, are often the most successful socially and academically. Effective leaders do not hide in back offices. However, in many schools, administrative functions and decisions take place in locations remote from teachers, students, and classrooms. School leaders find ways to involve the staff and students in decisions that will effect their lives at the school.

Moore, G.T. & Lackney, J.A. (1994). Educational facilities for the Twenty-first Century: Research Analysis and Design Patterns. Report R94-1, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research. Also available from ERIC Document Reproduction Service, No. EA 026223.

Principles for Shared School and Community Facilities
Educational Design Principle No. 20:

Establish a Community Forum

Provide a public assembly space to act as a community forum connecting the school and the community that is accessible, open, free-flowing, and flexible. A community forum is more than a big, open, undifferentiated space. The forum should have a ìtown squareî quality with small areas off the space for more specific activities. Provide for medium to large numbers of people for dance, music, drama, community meetings, exhibitions, and displays of student and community work. Auditoriums, as well as physical education facilities, such as gymnasiums and natatoriums, should be directly adjacent to this public space. The forum also acts as a break-out space for these large-assembly community activities. To meet students' behavior patterns in free time, allow some space off the public space for informal multi-purpose recreation and social gathering area with, when possible, direct access to informal outdoor gathering spaces. The social gathering space should have a livingroom feel. Include semi-private areas for individuals or groups to meet. Integrate the common gathering area with the formal entry sequence of the school.

Common gathering areas respond to the recognized need to provide an identity for the learning community. Schools traditionally have not provided space that was completely open in use, with the exception of the gymnasium, thus reducing opportunities for developing this cultural identity within the school. In addition, with the added needs of the community, areas that provide for a variety of uses can assist in connecting the school to the surrounding community.

Graves, B.E. (1993). School ways: The planning and design of Americaís schools. New York: McGraw-Hill.

Brubaker, W.C. (1998). Planning and designing schools. New York: McGraw-Hill.

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 21:

Allow for Community Conferencing Space

Adjacent to the commons area, provide a medium-sized multi-purpose interview/conference rooms to serve up to 12 community members for private group meetings or counseling. Place a large round table, movable seating within the largest space, along with storage, kitchen area, and display space. Communication is essential for the success of any organization. Like the workplace, the school needs meeting and conference rooms distinct from the more specialized instructional space for staff, students, parents, and community members to meet. These spaces can be used for community meetings and special events.

Educational Design Principle No. 22:

Create Privacy Niches

Develop several privacy niches or intimate counseling spaces for one-on-one or small group meetings for 2-4 persons that are relaxing, non-threatening, comfortable, and private. Include comfortable livingroom-type furniture. Connect these privacy niches to multi-purpose conferencing spaces, instructional areas and administrative areas. The relationship between a student and teacher is extremely important to the success of the educational process. To help foster this relationship, a school needs places of privacy for small, occasional meetings between its users.

Often visitors to the school have no identifiable place to inhabit when visiting. School partners who visit the school often have more sophisticated needs and often require space to set-up shop or facilitate special events within the school in order to be effective. Create publicly facing niches for visitors, parents, and adjuncts to conduct special activities or performances in the school. Place them in places accessible and visible from instructional area clusters. Provide an area for display or information as a backdrop for activities taking place in the niche. The niches are best located so as to attract attention when in use but be unobtrusive when empty.

Meek, A. (Ed.) (1995). Designing places for learning. Alexandria, VA: ASCD.

Educational Design Principle No. 23:

Weave Together Virtual and Physical Learning Spaces

Information technology is rapidly becoming ubiquitous in our society and has become an essential tool for business and industry. Information technology is precipitating a variety of changes in organizational and physical form of our schools. In the goal of integrating information technology into present school curricula, a variety of changes are being experienced. With respect to curriculum content and structure, technology is driving the curriculum in many schools to become more integrated between disciplines. With respect to instructional processes, technology is driving the movement toward self-directed learning and individualized instruction.

Although as learning becomes increasingly ìvirtualî and web-based it still must take physically take place somewhere. At present, information technology is often unevenly distributed in isolated computer labs in schools with a few computers scattered around the school building in instructional areas and media centers. As information technology becomes more available expect that technology to become more decentralized within the school/community facility. Create an integrated, flexible and complementary virtual learning space and distance learning programs that support and supplement the physical school and community learning center. Provide digital, audio, video, and computer links to and within all parts of the community learning center and to tertiary learning centers and sources such as business and community organizations, community colleges, and institutions of higher learning.

Butterfield, E. (1999, May). Planning today for tomorrow's technology. Designshare.
http://www.designshare.com/Research/Meeks/MeeksTech1.htm

OECÐ (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Redefining the place to learn. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Sanborn, F. (1997) How to choose learning stations & seating for your technology-based classroom. NCSA/NCREL & ITEG, LLC.
http://www.ncsa.uiuc.edu/idt/html/learnstat.html

Stuebing, S., Wolfshorndl, A., Cousineau, L.K., DiPetrillo, S.E. (1995). Redefining the place to learn. Programme on Educational Building, Paris, France: Organization for Economic Cooperation and Development

For further information on weaving together virtual and physical learning spaces
visit **http://www.edfacilities.org/ir/technology.cfm**

Community Spaces
Educational Design Principle No. 24:

Provide Opportunities for Job Training

A vital part of the overall community learning is that of job preparation and training. When possible, provide spaces ñ satellites of opportunity ñ for job training for the surrounding community and for students Ideally, these job preparation/training spaces should be provided in partnership with local business and industry. Business and industry sites can be used as extensions of the school learning environment for students and community members. When these sites are not available, when possible provide several small interview and assessment spaces, a setting for small group training activities and projects, and a large general space for support material. When resources are limited, job-training activities could take place in Community Conferencing Space.

In many smaller rural communities, the school is the largest public institution in the area, and as such these schools begin to take on social service functions often provided by local government. In larger urban districts, Tech-Prep and traditional vocational educational programs are being integrated with School-to-Work and school-to-career programs offering opportunities to explore career choices while students are still in school. In addition, many school districts are forming programmatic linkages between secondary and community college to ease the transition from school to career.

OECD (1996). Making better use of school buildings. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 25:

Provide Parent Information Centers

Provide a parent information center as an interface between the school and the community. The parent information center can serve to help interested parents learn more about the school, to exchange and share their diverse knowledge and information on any number of topics, to act as a public relations office, and, most importantly, to act as a home base for parents within the school. Provide a separate entry for the public, an direct link to the school, an informal seating area with information about the school displayed so that visiting parents and the community can get an idea of school activities, and one or more private meeting rooms.

Research has shown clearly that parental involvement in the school is associated with student success. Parents who are engaged in their school take an active interest in their childís progress. Offering a home base for parents within the walls of the school may create a sense of ownership in the school and encourage parents to stay involved.

Berner, M.M. (1993, April). Building conditions, parental involvement, and student achievement in the District of Columbia Public School System. Urban Education, 28(1), 6-29.

OECD (1996). Making better use of school buildings. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 26:

Provide Health Care Service Centers

Consider forming partnerships with local health agencies in providing on-site health-care center for students, parents, and members of the surrounding community. Provide space for a waiting area, separate from the school, and several private individual exam rooms, and a private office for the care provider. Many schools have realized that they must take on some social service functions to better serve the immediate needs of their learners. Expanding the old nurseís office into a more comprehensive partnership with local health care providers on the school grounds is one strategy in which schools can respond to the health needs of their learners without taking on the added administrative responsibility of operating the center.

OECD (1996). Making better use of school buildings. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

OECD (1995). Schools for cities. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

For further information on providing health care service centers in schools visit **http://www.edfacilities.org/ir/health_centers.cfm**

Character of All Spaces
Educational Design Principle No. 27:

Design Places with Respect for Scale and Developmental Need

The size and scale the building, its exterior elements and its interior spaces, make it possible for children to use spaces independently in a manner consistent with their evolving developmental capacities. For child-centered spaces, elements and spaces can be smaller and heights lower to accommodate children. Minimize the institutional character of buildings by creating more intimate spaces. Use natural materials and colors, a variety of forms and textures, vernacular elements, and extensive landscaping to create interesting and engaging spaces. Comfort for both children and teachers will require some compromises between child, youth, and adult-scales.

No one would doubt that child-scaled and familiar user-friendly spaces are more pleasant and comforting for children. In addition, there is some evidence that ësoftí classrooms are related to higher levels of voluntary participation and that overall aesthetic quality in educational facilities is related to studentsí task persistence.

Greenman, J. (1988). Caring spaces, learning places: Childrensí environments that work. Redmond, WA: Exchange Press.

Harms, T. & Clifford, R.M. (1980). Early childhood environment rating scale. New York: Teachers College Press.

Moore, G.T., Lane, C.G., Hill, Ann B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

Frost, J.L., Shin, D., & Jacobs, P. (1998). Physical environments and childrenís play. In Saracho, O.N. & Spodek, B. (Eds.) Multiple perspectives on play in early childhood education. New York: State University of New York Press.

Tanner, C. K. (1997). Chart of Architectural/Natural Support Systems for School Design and Construction. University of Georgia. **http://www.coe.uga.edu/sdpl/archives.html#anchor1107537**

Educational Design Principle No. 28:

Maximize Natural and Full-Spectrum Lighting

Maximize task-appropriate lighting, eliminate standard cold-white fluorescent lighting, and emphasize natural and full-spectrum lighting throughout the school/community center. When siting the building and deciding on the internal placement of nested learning groups, face indoor activity spaces toward the most favorable microclimatic directions, e.g., south-facing activity spaces leading to outdoor learning areas that are also in the most favorable microclimatic locations.

Natural light and artificial full-spectrum lighting has been found to minimize mental fatigue as well as reduce hyperactivity in children. Studies have shown that students tend to react more positively to classrooms that have windows. Further, it has been found that fluorescent lighting may be related to greater amounts of stress and hyperactivity in learners. By providing installing full-spectrum lighting and maximizing controlled natural daylighting, schools may not only improve student performance but also achieve more responsible economic and energy conscious buildings.

Dunn, R., Krimsky, J.S., Murray, J.B. & Quinn, P.J. (1985, May). Light up their lives: A review of research on the effects of lighting on childrenís achievement and behavior. The Reading Teacher. 863-869.

Grocoff, P.N. (1995, December). Electric lighting and daylighting in schools. Council of Educational Facility Planners International (CEFPI) Issue Track.

http://www.cefpi.com/

Heschong Mahone Group. (1999, August). Daylighting in schools: An investigation into the relationship between daylighting and human performance. Daylighting Initiative, The Pacific Gas and Electric Company on the behalf of the California Board for Energy Efficiency Third Party Program.
http://www.pge.com/pec/daylight/schoolc.pdf

Kleiber, D., et al. (1973). Environmental illumination and human behavior: The effects of spectrum light sources on human performance in a university setting. Ithaca, N.Y.: Cornell University Press.

Mayron, L.W., Ott, J., Nations, R., Mayron, E.(1974). Light, radiation and academic behavior. Academic Therapy, 40, 33-47.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Ott, John N. (1976, August/September). Influence of fluorescent lights on hyperactivity and learning disabilities. Journal of Learning Disabilities, 9:7, 22-27.

For further information on maximizing natural and full-spectrum lighting visit **http://www.edfacilities.org/ir/lighting.cfm**

Educational Design Principle No. 29:

Design Healthy Buildings

Achieving good indoor air quality is as essential as providing comfortable, healthy thermal conditions and functional, aesthetically sound lighting and acoustical environments. Design environmental control systems to maintain temperatures well within the thermal comfort zone and maximize individual control as much as possible at the site of learning. Strategies for improving indoor air quality include increasing levels of fresh-air intake and increased ventilation rates in buildings. These preventive design measures cost very little and save energy, as well as provide a more healthy environment for learners.

Thermal comfort has been shown to influence task performance, attention spans and levels of discomfort. Thermal conditions are below optimal levels affect dexterity, while higher than optimal temperatures decrease general alertness and increase physiological stress. Two types of energy conservation measures (often blamed for so-called sick-building syndrome) have been shown to directly increase indoor air pollutant concentrations: inappropriately reducing ventilation and using sealants and caulks that emit pollutants. These factors may be affecting not only performance but also the overall physical health of children. Children in ësick buildingsí have been found to exhibit clear signs of sensory irritation, skin rashes, and mental fatigue ñ all factors with the potential of decreasing the ability of students to perform.

Berglund & Lindvall. (1986). Sensory reactions to sick buildings. Environment International, 12, 147-159.

Cohen, S., Evans, G.W., Stokols, D., & Krantz. D.S.(1986). Behavior, health, and environmental stress. New York: Plenum.

McGuffey, C.W. (1982). Facilities. In Walberg, H.J. (Ed.) Improving educational standards and productivity: The research basis for policy. Berkeley, CA: McCutchan Publishing. 237-288.

Miller, Norma L. (1995). The healthy school handbook: Conquering the sick building syndrome and other environmental hazards in and around your school. Washington, D.C.: National Education Association Professional Library Publication.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

For further information on designing healthy buildings visit:
http://www.edfacilities.org/ir/iaq.cfm

Educational Design Principle No. 30:

Design for Appropriate Acoustics

Whenever possible, provide sound absorbing materials on floors, walls and ceilings, locate schools away from noisy and congested urban streets, separate active noisy areas in the school from quiet study areas. Within instructional areas provide acoustical barriers that diminish the effects of different sounds, noises and speech patterns that distract learners from focusing. Provide acoustically controlled, well-defined areas within a single instructional area that respond to the special learning activities requiring concentration such as self-directed study and individual reading areas.

It is well accepted in the scientific community, that prolonged exposure to high-intensity noise in community or work settings is often harmful to the health and behavior of large segments of the exposed populations. Noise in the learning environment can originate from within as well as outside the school building and can be both short and long-term. Both forms of noise can have major affects on student behavior and in some cases, achievement. Studies have concluded there are significant increases in blood pressure associated with schools being near noisy urban streets. Exposure to traffic noise at elementary schools also has been associated with deficits in mental concentration, making more errors on difficult tasks, and greater likelihood of giving up on tasks before the time allocated has expired. Noise may for example decrease teaching time for forcing teachers to continuously pause or by making it difficult for the student and teacher to hear one another.

Cohen, S., Evans, G.W., Stokols, D., & Krantz. D.S.(1986). Behavior, health, and environmental stress. New York: Plenum.

Evans, G.W., Kliewer, W. & Martin, J. (1991). The role of the physical environment in the health and well-being of children. In H.E. Schroeder (Ed.), New Directions in Health Psychology Assessment (pp. 127-157). New York: Hemisphere.

Evans, G.W. & Lepore, S.J., (1993). Nonauditory effects of noise on children: A critical review. Children's Environments, 10(1), pp.31-51.
Evans, G.W. & Maxwell, L., (1997). Chronic noise exposure and reading deficits: The mediating effects of language acquisition. Environment and Behavior, 29(5), pp.638-656.

Maxwell, L. & Evans, G. W. (1998). Design of Child Care Centers and Effects of Noise on Young Children.
http://www.designshare.com/Research/LMaxwell/NoiseChildren.htm

Nelson, P.B. (1997, June 7). Impact of hearing loss on children in typical school environments. Acoustical Society of America 133rd Meeting Lay Language Papers, 133rd ASA Meeting, State College, PA.
http://www.acoustics.org/133rd/2paaa2.html

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Picard, M. & Bradley, J.B. (1997, June 7). Revisiting speech interference by noise in classrooms and considering some possible solutions. Acoustical Society of America 133rd Meeting Lay Language Papers, 133rd ASA Meeting, State College, PA. **http://www.acoustics.org/133rd/2paaa3.html**

For further information on the design of appropriate acoustics visit **http://www.edfacilities.org/ir/acoustics.cfm**

Site Design and Outdoor Learning Spaces
Educational Design Principle No. 31:

Allow for Transitional Spaces Between Indoor and Outdoor Spaces

Learning space within the building should connect to outdoor learning spaces while creating additional transition spaces for school and community activities. Create weather-protected transition spaces between inside and outside including porches and decks a minimum of six feet in depth that can serve as learning activity spaces in their own right. Maximize views in and out.

Transitional spaces such as overhangs and porches will encourage various levels of learning activities in the outdoors that might not otherwise occur since they offer more opportunities to engage the natural environment visually, aurally and kinesthetically.

Greenman, J. (1988). Caring spaces, learning places: Childrensí environments that work. Redmond, WA: Exchange Press.

Moore, G.T. & Lackney, J.A. (1994). Educational facilities for the Twenty-first Century: Research Analysis and Design Patterns. Report R94-1, School of Architecture and Urban Planning, University of Wisconsin-Milwaukee: Center for Architecture and Urban Planning Research. Also available from ERIC Document Reproduction Service, No. EA 026223.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Educational Design Principle No. 32:

Establish a Variety of Outdoor Learning Environments

Create spaces outside and adjacent to the building on site or on neighboring sites that mirror learning space within the building. Locate outdoor play and activity areas on the south of the building to catch as much sun and light as possible, especially in the winter, spring, and fall months. To maximize the chance of year-round use of parts of the outdoors, create favorable microclimates by protecting outdoor activity areas from prevailing winter winds and from the extreme summer sun while allowing winter sun to penetrate. As much as possible, learning environments should allow for a variety of learning activities and experiences not available indoors such as nature trails, gardens, exploratoriums, fields, forested areas, ponds and other natural outdoor learning settings. In school settings where land is not available, or funds do not allow, the school might take advantage of the local communityís existing neighborhood resources such as parks, public space, walking tours, and community and business establishments.

Outdoor activity areas for younger learners can be modeled after a series of interconnected developmentally appropriate back yards, with resource-rich activity pockets zoned appropriately and linked by clear circulation which overlooks. Provide for a diversity of activities (i.e., not only gross-motor play, but also reading/listening, gardening, and fantasy play).

Outdoor space can be used for more than simply ìburning off energyî before the real studying begins inside. Outdoor settings are often a missed opportunity for learning and can be a valuable resource and laboratory for exploratory learning not possible in built environments.

Brett, A., Moore, R.C. & Provenzo, E.F., Jr. (1993). The complete playground book. New York: Syracuse University Press.

Dempsey, J.D. & Frost, J.L. (1993). Play environments in early childhood education. Pp. 306-321. In Spodek, B. (Ed.) Handbook of Research on the Education of Young Children. New York: MacMillan.

Greenman, J. (1988). Caring spaces, learning places: Childrensí environments that work. Redmond, WA: Exchange Press.

Kritchevsky, S.,Prescott, E. & Walling, L. (1977). Planning environments for young children: Physical space. Washington, D.C.: National Association for the Education of Young Children.

Moore, R.C., Goltsman, S.M. & Iacofano, D.S. (1992). Play for all Guidelines: Planning, design and management of outdoor play settings for all children. Berkeley, CA: MIG Communications.

Moore, G.T., Lane, C.G., Hill, Ann B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

OECD (1996). Schools for today and tomorrow. PEB Papers. Paris, France: Programme on Educational Building. Organization for Economic Co-operation and Development.

Stine, S. (1997). Landscapes for learning: Creating outdoor environments for children and youth. New York: John Wiley & Sons.

For further information on establishing a variety of outdoor learning environments visit
http://www.edfacilities.org/ir/playgrounds.cfm

Educational Design Principle No. 33:

Separate Children and Pedestrians from Vehicles and Service

For purposes of safety, buffer all children and pedestrian areas away from all vehicular and service areas. The building may be the buffer between these zones, with children's activity areas and pedestrian access from the south, vehicular access from the east or west, and service and parking on the north, or the buffer may be created by a combination of landscaping and fencing.

Greenman, J. (1988). Caring spaces, learning places: Childrensí environments that work. Redmond, WA: Exchange Press.

Moore, G.T., Lane, C.G., Hill, Ann B., Cohen, U. & McGinty, T. (1979). Recommendations for child care centers. Report No. R79-2. Center for Architecture & Urban Planning Research. University of Wisconsin-Milwaukee.

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